INFLUENZA (Select Individual Cases and Outbreaks)
(also see Respiratory Disease Outbreaks)

Note: Suspected influenza outbreaks should be initially reported as respiratory outbreaks (unknown) until laboratory testing confirms influenza as the etiology.

1. **Agent**: Influenza viruses. Only influenza A and B are of public health concern since they are responsible for epidemics.

2. **Identification:**

   a. **Symptoms**: **Influenza-Like Illness (ILI)/Acute Febrile Respiratory Illness (AFRI) refers to:** Fever (≥100°F or 37.8°C) **plus** cough and/or sore throat. More specific symptoms include new acute onset of fever (≥100°F or 37.8°C), cough, sore throat, shortness of breath, chills, headache, myalgia, and malaise. Can sometimes also cause gastrointestinal (GI) symptoms. Duration is 2-4 days in uncomplicated cases, with recovery usually in 5-7 days. Infection with non-human strains of influenza such as avian influenza viruses theoretically may cause other illness, such as conjunctivitis, gastroenteritis or hepatitis.

   Note: Illness may present differently in young children, the elderly, and immunocompromised individuals. Therefore absence of ILI symptoms does not effectively rule out influenza and high clinical suspicion must be maintained during the flu season.

   a. **Differential Diagnosis**: Other agents that cause febrile respiratory illnesses or community acquired pneumonia including, but not limited to *Mycoplasma pneumoniae*, adenovirus, respiratory syncytial virus, rhinovirus, parainfluenza viruses, *Legionella* spp, and coronavirus.

   b. **Diagnosis**: Confirmed by viral isolation, PCR, rapid antigen test, or a DFA/IFA test, and compatible symptoms.

3. **Incubation**: 1-4 days; average 2 days.

4. **Reservoir**: Humans, swine, and migratory birds.

5. **Source**: Mostly droplet spread by nasal or pharyngeal secretions and sometimes fomites.

6. **Transmission**: Large droplet spread (cough or sneeze) from infective persons or sometimes contaminated fomites. Airborne spread possible, but unlikely.

7. **Communicability**: People infected with flu shed virus and may be able to infect others from 1 day before getting sick to 5 to 7 days after. This can be longer in some people, particularly those with weakened immune systems

8. **Specific Treatment**: Supportive care (e.g., rest, antipyretics, fluids, etc.). Antiviral medications may reduce the severity and duration of influenza illness if administered within 48 hours of onset. These same medications may be useful for hospitalized patients or those who are immunocompromised or if vaccine does not cover circulating strain.

   Streptococcal and staphylococcal pneumonias are the most common secondary complications and should be treated with appropriate antibiotics.

9. **Immunity**: Permanent for a specific strain.

REPORTING PROCEDURES

1. **Outbreak Definitions:**

   Under Title 17, Section 2500, *California Code of Regulations* all suspected outbreaks are reportable.

   Healthcare-associated institutions associated with long term health care (i.e. skilled nursing facilities, intermediate care facility, and intermediate care for developmentally disabled)**:** A sudden increase of acute febrile respiratory illness cases over the normal background rate; OR at least **one case** of laboratory-confirmed influenza in the setting of a cluster (≥2 cases) of **ILI** within a 72-hour period.

Non healthcare-associated institutions defined as prison, jail, university dormitory and overnight camps: At least two cases of ILI within 48-72 hour period; OR at least one case of ILI with laboratory confirmation for influenza in the setting of a cluster (≥2 cases) of ILI.

Congregate Settings defined as schools and day camps: At least 10% of average daily attendance absent with ILI sustained over a 3-day period; OR 20% of an epidemiologically-linked group (such as a single classroom, sports team, or after-school group) ill with similar symptoms, with a minimum of 5 ill, sustained over a 3-day period.

2. **Single cases reportable**.

   a. Under Title 17, Section 2500, California Code of Regulations, all cases due to "novel" influenza A (for example due to avian or swine influenza) are reportable immediately.

      Avian flu (H5N1 or H7N9) refers to the disease caused by infection with avian (bird) influenza (flu) Type A viruses. These viruses occur naturally among wild aquatic birds worldwide and can infect domestic poultry and other bird and animal species. Avian flu viruses do not normally infect humans, however, sporadic human infections with avian flu viruses, have occurred. Can also be identified as highly pathogenic avian influenza (HPAI).

      For more information about avian influenza, visit: http://www.cdc.gov/flu/avianflu

      Swine flu (H3N2v, H1N1v, H1N2v) refers to the disease caused by infection with swine (pig) influenza (flu) Type A viruses. These viruses occur naturally among domesticated swine. Swine flu viruses do not normally infect humans but secondary human infections may occur from time to time. When it occurs, the strain of influenza is called "variant" to identify that it is not a "normal" human virus. However pigs can be infected with swine, avian, and human viruses at the same time. When this occurs, genes may be swapped between the different types of viruses resulting in the development of a new viral strain that is easily transmitted between humans. This occurred in 2009 with the development of the 2009 pandemic H1N1.

      For more information about swine influenza see http://www.cdc.gov/flu/swineflu/

   b. In Los Angeles County, **influenza associated deaths of *any* age** are reportable. Influenza-associated deaths must have had: 1) confirmed influenza by laboratory testing; 2) a clinical syndrome consistent with influenza or complications of influenza and 3) a clear progression from onset of illness to death. These Los Angeles County specific reporting requirements may change as circumstances change.

3. **Report Forms: SEE TABLE 1**

   a. Use the following forms for outbreaks at various settings:

      i. **Non healthcare-associated institution**

      INITIAL ASSESSMENT OF RESPIRATORY OUTBREAK REPORT (10/14)
      (Working form, not required to submit)

      Line List-Non-Healthcare Facility for Students, Staff, or Residents **(PDF (5/15) EXCEL) *Required**

      ACUTE RESPIRATORY ILLNESS OUTBREAK REPORT FORM (CDPH 9003 08/16) *Required

      ii. **Healthcare-associated institution**
      For initial and final reports of influenza outbreaks:

      CD OUTBREAK INVESTIGATION — SUB-ACUTE HEALTH CARE FACILITY (H-1164-SubAcute, fillable)

      Line List - Respiratory Outbreak for Residents and Staff (PDF (9/15) EXCEL) *Required

ACUTE RESPIRATORY ILLNESS OUTBREAK REPORT FORM (CDPH 9003 08/16) *Required

b. Use the following forms to report a single case of fatal influenza:

INFLUENZA FATALITY CASE REPORT FORM (acdc-influ 2/14)

4. **Epidemiologic Data for Outbreaks:**

a. Establish a case definition (i.e., fever [measured or reported] and either cough, sore throat, or stuffy nose): include pertinent clinical symptoms and laboratory data (if appropriate).

b. Confirm etiology of outbreak using laboratory data (rapid test, culture, or PCR). **At least 1 patient must have tested positive for influenza in an outbreak to call it an "influenza" outbreak.** Otherwise call it a "respiratory outbreak of unknown origin."

c. Create a line list that could include:
   i. names of cases
   ii. dates of onset
   iii. symptoms
   iv. age
   v. hospitalization status
   vi. results of laboratory tests
   vii. prior immunization history
   viii. epi links to other cases (room #s, grades in school, etc)
   ix. avian or swine exposure, if relevant

d. Maintain surveillance for new cases until rate of influenza is down to "normal" or no new cases for 1 week.

e. Create an epi-curve, by date of onset. Only put those that meet the case definition on the epi-curve. (Optional)

CONTROL OF CASE, CONTACTS & CARRIERS

CASE:

Precautions: Advise symptomatic patients to stay away from work, schools, camps, and mass gatherings for at least 24 hours after resolution of fever. Limit exposure to others, especially those at high risk for complications.

Advise cases who work in health care settings not to return to work until 7 days after symptom onset or 24 hours after resolution of symptoms, whichever is longer.

As of 2010, there are two FDA approved drugs for the prevention and treatment of influenza A and B: **oseltamivir** (Tamiflu®) and **zanamivir** (Relenza®). Possible antiviral resistance should be considered before prescribing antivirals.

To follow current recommendations for treatment and prevention of influenza or for additional information about the use of antivirals for treatment and prophylaxis see:
http://www.cdc.gov/flu/antivirals/index.htm

CONTACTS: No restrictions.
Prophylaxis with appropriate antiviral medication during outbreaks is advised for high-risk patients who have not been vaccinated or when the vaccine is of questionable efficacy.

CARRIERS: Not applicable.

GENERAL CONTROL RECOMMENDATIONS FOR OUTBREAKS

1. Reinforce good hand hygiene among all (including residents/patients, visitors, staff, and residents/students).
2. Emphasize respiratory etiquette (cover cough and sneezes, dispose of tissues properly).
3. Reinforce staying home when sick.
4. Provide posters and health education about hand hygiene and respiratory etiquette.
5. Discourage sharing water bottles.
6. Emphasize importance of early detection of cases and removing them from contact with others.
7. Encourage standard environmental cleaning with EPA registered disinfectant appropriate for influenza viruses.
8. Consider canceling group activities.
9. Consider using influenza vaccine to control situation (consult with ACDC).
10. Consider post-exposure prophylaxis with antiviral medications for high-risk contacts (consult with ACDC).
11. Provide educational materials to facility-including posters, handouts, etc. For influenza and respiratory virus health

education materials see: http://publichealth.lacounty.gov/acd/HealthEdFlu.htm

Consider the additional recommendations for health care institution, especially with high risk patients:

1. Close facility or affected areas to new admissions until 1 week after last case.
2. Suspend group activities until 1 week after last case.
3. If possible, separate staff that cares for sick from staff that cares for well patients.
4. Institute droplet precautions for symptomatic patients.
5. Refer to Los Angeles County Department of Public Health Influenza Outbreak Prevention and Control Guidelines for Skilled Nursing Facilities (6/2015) **or** California Department of Public Health Recommendations For The Prevention And Control Of Influenza California Long-Term Care Facilities (Revised October 2016) **or** Centers for Disease Control and Prevention (CDC) Interim Guidance for Influenza Outbreak Management in Long-Term Care Facilities | Health Professionals | Seasonal Influenza (Flu) (10/05/16)
6. Strongly consider using antiviral post-exposure prophylaxis or vaccine to control outbreak (consult with ACDC or AMD).

DIAGNOSTIC PROCEDURES

Clinical and epidemiologic histories are required to aid in laboratory test selection.

Nasopharyngeal (NP) or nasal swab, and nasal wash or aspirate. PHL recommends Dacron or Nylon flocked swabs, do NOT use wooden swabs. NP swabs are preferred because the specimens can be tested for influenza and a variety of other respiratory pathogens using PCR based technology. All other specimens can only be tested for influenza. Samples should be collected within the first 4 days of illness. Collect specimens from **at least 2 separate symptomatic individuals** and up to 5 symptomatic individuals for any community-based outbreak and select those individuals with the most recent onset for specimen collection.

1. Diagnostic tests available for influenza include viral culture, serology, rapid antigen testing, polymerase chain reaction (PCR), and immunofluorescence assays

2. **NOTE:** Culture should not be attempted when avian influenza is suspected. Contact Public Health Laboratory (PHL) or ACDC for instructions.

   Container: Viral Culturette with M4 viral transport medium.

   Laboratory Form: Public Health Laboratory Test Requisition Form H3021 (01/14) or online request if electronically linked to the PHL.

   Examination: Influenza PCR and/or Respiratory Pathogen PCR Panel. Testing algorithm is determined by the PHL.

   Material: Nasopharyngeal swab preferred; nasal swab can be used if necessary. See: MD/ND Policy 117 Nasopharyngeal Specimen Collection (7/28/16); Competency Checklist for Nasopharyngeal Specimen Collection

   Storage: Keep refrigerated and upright. Deliver to PHL as soon as possible. Additional specimen and storage information can be found here: LA County Department of Public Health - Public Health Laboratory (7/28/16)

PREVENTION/EDUCATION

1. All persons >6 months are recommended to receive an annual influenza vaccine.

2. Practice good personal hygiene, avoid symptomatic persons during outbreaks, and do not go to work or school when ill with a respiratory disease.

3. Do not give aspirin to children with influenza and other viral illnesses.

4. Postpone elective hospital admissions during epidemic periods, as beds may be needed for the ill.

5. Sick visitors and staff should not be allowed in the facility.

TABLE 1. RESPIRATORY DISEASE OUTBREAK FORMS

NON HEALTHCARE-ASSOCIATED INSTITUTIONS	INITIAL REPORT	FINAL REPORT
○ Congregate Settings-Schools and day camps ○ Non healthcare-associated institutions(i.e. jail, juvenile hall, camps, university dormitory, and overnight camps)	**INITIAL ASSESSMENT OF RESPIRATORY OUTBREAK REPORT (acd-obrespinitial 10/14)** (Working form, not required to submit))	**ACUTE RESPIRATORY ILLNESS OUTBREAK REPORT FORM (CDPH 9003 08/16)*Required** **Line List-Non-Healthcare Facility for Students, Staff, or Residents (PDF, (acd-obrespsheetnonhealth, 05/15) EXCEL) *Required**
HEALTHCARE – ASSOCIATED INSTITUTION	**INITIAL REPORT**	**FINAL REPORT**
○ Skilled nursing facility ○ Intermediate care facility ○ Intermediate care for developmentally disabled	**CD OUTBREAK INVESTIGATION — SUB-ACUTE HEALTH CARE FACILITY (H-1164-SubAcute, 05/08, fillable) (instructions H-1164, SubAcute Reference, 05/08))**	**CD OUTBREAK INVESTIGATION — SUB-ACUTE HEALTH CARE FACILITY (H-1164-SubAcute,05/08, fillable)** **Line List - Respiratory Outbreak for Residents and Staff (PDF acd-obrespsheethealth 09/15) EXCEL) *Required** **ACUTE RESPIRATORY ILLNESS OUTBREAK REPORT FORM (CDPH 9003 08/16)*Required**